

Northern Sparks



Report of the North of England Electrification Task Force

March 2015

Foreword by Andrew Jones MP

Chair of the North of England Electrification Task Force

Welcome to the report of the North of England Electrification Task Force. Our brief was to prioritise the rail lines of the North of England for future electrification and we have done that.

The thirty-two lines of the Northern Rail and TransPennine Express franchise areas currently without electrification have all been considered and prioritised. The results have been grouped into three tiers, with Tier One being the most immediate priority.

We have placed economic growth at the centre of our work. The Task Force agreed early on that the economic benefits of electrification would be the dominant factor in our assessments.

We have worked on the premise that all the lines of the North would be electrified, it is only a question of when.

This report is a team effort. That team has come from across the North; bringing together different regions, different political parties and different tiers of government. And it has been a harmonious and unanimous effort throughout.

It is from the North for the North. It is to be seen in the context of the government's investment in the electrification of our rail network. It is also to be seen in the context of the Northern Powerhouse and the work to drive the economy of the North of England.

I would like to thank all the Task Force members - Julie Hilling MP, Ian Swales MP, The Leader of Bradford City Council (Cllr Dave Green) and the Leader of Warrington Borough Council (Cllr Terry O'Neill) – for all their hard work and enthusiasm.

We have been well supported by an excellent officer team. They have brought insight and again, enthusiasm. The Task Force thanks them all.

As a Task Force we have been clear that investment in infrastructure is sorely needed across the North; that it would drive economic growth and improve the lives of northerners. The recommendations in this report provide direction for where investment should go next.

We recognise that the modernisation of our national rail network is a task of generational scale requiring huge investment. But the job has started, and this report is intended to look years ahead, beyond one control period.

We want a rail network in the North that meets the needs of the North. A network that is expanded, efficient and electrified. This report is the Task Force's view of where the next steps start.



Andrew Jones MP
Member for Harrogate and Knaresborough

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1. *Summary*



The North of England Electrification Task Force was announced by the Secretary of State for Transport in December 2013, with a remit to consider the priority order for the electrification for those sections of the North of England rail network which are not included in current industry plans. In carrying out this work the Task Force has focussed on the benefits to the northern economy which would flow from further electrification with a strong emphasis on supporting economic growth across the region.

The first task we undertook was to establish the baseline – the existing electrified network and those schemes which are committed for delivery by the end of this decade. Concurrently the strategic economic plans and supporting materials for the entire region were collated, together with material from detailed studies into the electrification of some routes. This material provided the background to our subsequent analysis.

A second stream of work established a set of three criteria which would be used to rank routes in priority order – always on the understanding that this was an exercise in prioritisation and not justification for electrification. The selected criteria were:

- The economic benefits enjoyed by individuals and society as a whole through the changes in perceived journey times, from faster acceleration and through a reduction in crowding which gives a more pleasant journey, such benefits feeding through into changes in Gross Value Added (GVA) resulting from better access between jobs and housing (there is an assumption in our analysis that electrification will bring extra capacity to relieve crowding, even if there are no other changes to the service specification)
- The extent to which electric trains replace diesels which is a proxy for the impact on carbon emissions; the reduction in operating costs, and the ability to cascade newer rolling stock to the remaining non-electrified services. These should all be benefits to the region over the longer term
- The quality of the rolling stock currently used and the levels of crowding, which together indicate the broader impact that newer and higher capacity trains would have on the perception of the railway and its ability to facilitate growth in the economic centres.

Criterion	Calculation of score
<p>Economic benefits</p> <p><i>All are based on the reduction in perceived journey time arising from an electric service of the same frequency and stopping pattern as the current service</i></p> <p>50% of overall score</p>	<p>Existing and new passengers save time because they have a faster service than they did previously</p> <p>Those in the wider community who continue to drive save time because there is less traffic on the roads as people travel by train instead of car.</p> <p>An increase in economic output resulting from the agglomeration effects (drawing communities together) due to the reduction in journey times</p>
<p>Impact on services, costs and environment</p> <p>20% of overall score</p>	<p>The ratio of diesel vehicle kms replaced by electric to the Electrified Track kms required.</p>
<p>Providing Capacity and Quality - Rolling stock enhancement and replacement</p> <p>30% of overall score</p>	<p>Calculated from: A measure of current overcrowding – calculated as a perception of a longer journey if there are standing passengers;</p> <p>the number of diesel vehicles replaced, and the age/ quality of rolling stock currently used.</p>

All non-electrified sections of railway in the North of England which carried a passenger service – an area roughly covering the operating territories of the Northern and TransPennine Express franchises – were considered against these three criteria. Individual sections of line were grouped together by reference to the predominant services over them and also logical points of connection with the existing electrified network. No new assumptions were made about post electrification service patterns – the current timetable was taken as the basis for analysis and no through links were broken in response to the partial electrification of a longer route.

Data for the analysis was drawn from a wide variety of sources, all against a consistent base of rail industry records (service resources, patronage and route descriptions). Standard forecasting tools were used for the analysis, with economic parameters taken directly from Department for Transport (DfT) Webtag sources.

The calculated weighted scores ranged from 84 to 7. On the basis of these scores the Task Force grouped potential electrification projects into three distinct tiers. The content of each tier is shown on the map on page 9, against the baseline electrification expected to be in place by 2020.

In conclusion this report presents the case for a rolling programme of electrification in the North of England driven by the need to:

- allow the northern economy to benefit from agglomeration and yet grow sustainably by prioritising rail use over car access to the rejuvenated centres
- reduce the long term costs of operating the railway, particularly allowing the efficient operation of high frequency services
- put in place a rail infrastructure which is suitable for a low carbon future.

The schemes identified in Tier One should be taken forward urgently through a full business case analysis so that they can be properly considered in the funding cycle for the Control Period 2019 to 2024. The Task Force recommends that this preparatory work is considered for immediate funding in the 2015-2016 financial year.

2.

Our remit



2.1 Framework

The North of England Electrification Task Force was set up by the Secretary of State for Transport to recommend the priorities for electrifying the remaining rail routes in the North of England, seen from a northern perspective; as a precursor to the preparation of detailed business cases and quantified justification, which must follow. By establishing priorities now we hope to direct this further work to those routes where there will be most immediate benefit to the economy of the North through electrification and establish a framework for a rolling programme of work which has as its long term aim the electrification of virtually all the railway across the North of England. This assumes that this programme meets the criteria for value for money and fits with wider objectives for a low carbon economy. (Terms of Reference: Appendix 1)

This work is being carried out in parallel with the rail industry's Long Term Planning Process, which takes a look thirty years ahead to develop priorities for investment and a strategic direction for critical infrastructure, like electrification. This process has a number of strands:

- Market studies which identify the strategic goals for each market sector of the rail industry over the next thirty years, forecast the level of demand and the opportunities that may bring, and formulate indicative outputs that would be needed in order to meet the strategic goals.
- Route Studies that bring together the conditional outputs for all the market sectors for a particular part of the network, evaluate the trade-offs between the outputs for the different sectors and between the outputs and costs (including the cost of changes to capability), and form a view of the likely long-term (2043) allocation of capacity between sectors in order to present choices to funders on the appropriate capability of the network.
- Network-wide studies (like the Electrification RUS referred to later) to identify strategic choices and appraise solutions to network-wide issues, including the benefits and challenges of technological change across the network.

The Long Term Planning Process (LTPP) will inform (and be informed by) funders' decisions on industry outputs.

For the High Level Output Statement process, the Route Studies and associated Network Route Utilisation Study (RUS) strategy documents are expected to be the main source of proposals to put to funders in the Initial Industry Plans for Control Period 6 (2019-2024) and beyond. The LTPP as a whole will help develop priorities for the various funding mechanisms such as the Network Rail Discretionary Fund, Strategic Freight Network and Scottish Small Projects fund.

The Long Term Rail Strategy, adopted by Rail North (see Appendix 6 for link to this), sets a vision for the rail service that is needed to support the aspirations for the economy of the North of England over the next twenty years and so seeks to be a major input to these industry plans as they are worked out in the region. The core message - or Objectives - from the Strategy are that the rail network should be developed, so it is:

- Supporting sustainable economic growth;
- Enhancing service quality, improving the appeal of rail and, by encouraging more rail use, reducing environmental impacts and carbon emissions; and
- Improving efficiency, reducing the cost per passenger and per tonne of freight carried.

Whilst this vision can in part be delivered with diesel power the consensus picture from around the world is that electric traction is the preferred solution for intensive services with frequent stops – the sort of railway which will emerge in much of the North as the Long Term Rail Strategy is implemented.

Our work is in this context, with a different emphasis from the parallel Network RUS Electrification Strategy being carried out by the rail industry as part of LTPP. That work concentrates on the effects of electrification on today's railway:

- accommodating future growth
- the operational cost savings that would result for the industry
- the benefits to current and future passengers, and
- the environmental benefits of reduced greenhouse gas emissions.



This rail industry work also looks at all lines in Great Britain, with detailed appraisal work concentrating on those identified by an initial quantified prioritisation. On this basis the RUS will carry out full HM Treasury approved appraisals on around 25% of the non-electrified rail network in the North of England after the initial sifting

Following our prioritisation exercise for the North of England, business cases for each route will need to be developed, to justify the significant investment needed to take forward a programme of electrification. These will take into account wider economic benefits to the region as it grows, the operational efficiencies accruing when considered in the context of a much enhanced level of service and a long term view on air quality, energy security and carbon emissions. In other words these subsequent analyses are unlikely to be just a look at today's railway. They will also take into account the status of schemes which are higher up the priority order, where there are synergies which have not been included in our initial analysis.



3.

Background and Baseline



3.1 The National Economic Context

It is now accepted that the economy of the North of England is currently underperforming in relation both to other parts of Great Britain and also to its potential. This has many implications for the nation as a whole, including:

- a perception that overall economic growth is lower than it otherwise should be
- the widely accepted view that the British economy is unbalanced, with significant overheating in London and the South East and spare capacity in the North.

There are many reasons for this, stemming from the historic geographic split in Britain between manufacturing and service sector industries and particularly the preponderance of heavy industry in the North of England until the 1980's. The current transport networks are now considered one of the critical constraints on transforming the northern economy. In particular they may be limiting the growth of new jobs in the main centres of the region because these 'new economy' jobs require:

- a large residential hinterland to give an adequate pool of suitably qualified employees
- concentrated development for both the workplaces and also the supporting services.

The former requires fast, but also frequent transport links over distances which have hitherto been unusual for commuter journeys in the North. The latter needs high capacity links to allow much higher density developments in northern town and city centres, which have traditionally played a less prominent role in the overall employment mix of the region.

This background picture lies behind the growing desire to rebalance the British economy away from its current focus of the South East of England and the financial services sector. This is driven both by the need to spread growing wealth more evenly across Britain and also reduce pressure on the infrastructure in and around London. The Northern Powerhouse is now an accepted part of the vision for a resurgent North which lies behind our work described in this paper.

All local stakeholders across the North of England are clear that better connectivity between the communities is a key to unlocking potential and generating wealth, by allowing much greater interaction between people and offering a wider choice of residential, employment and leisure opportunities to each individual. The delivery of this connectivity is about making travel easier, essentially quicker and with more capacity.

The rail network is seen as a critical component in delivering this vision because it has the potential to knit together communities across a wide swathe of country and also provide the capacity for the growth of main centres of the North which are key economic drivers. The local authorities across the North of England believe that the local rail network has not seen an appropriate level of investment over the last twenty years and now needs significant enhancement in both efficiency and capability if it is to underpin the regeneration of the region. This has started with the investment now taking place in key projects like the Northern Hub and North Transpennine Electrification.

Concerns have been expressed over recent years about the need to replace many of the trains currently in service across the North with modern equivalents. There is now a commitment to include renewal of a good proportion of the Northern franchise train fleet over the next five years, and this will see around 100 train sets retired. Replacing these and providing the capacity needed to reducing crowding on the current network, requires a substantial injection of new and heavily refurbished rolling stock. This is a requirement simply to stand still and it is only part of the story.

Over the next ten years the ambition is to create some 150,000 new jobs in the town and city centres across the North. Most of these new employees will need to use public transport to travel to and from work. Recent experience has shown that the rail network will play a major part in providing the necessary capacity and connectivity to support this growth. Those responsible for the rail networks around these places believe that the current expectations imply a requirement for between 45 and 90 additional four-car trains to provide for the anticipated increase in demand. This would be in addition to the rolling stock needed to replace the life expired trains and alleviate current crowding.

As we will outline later this level of enhancement is most effectively delivered by an electrified railway, because of the long term efficiencies this gives create the climate for growth and reduce the incremental costs of providing the necessary levels of service. Within current rail industry plans most of the trunk routes in and through the North will be electrified by 2020, once the Midland Main Line from London to Sheffield and the core North Transpennine route between Leeds and Manchester are added to the electric network. But to make a real difference much more need to be done on the lines which knit together the communities of the North, particularly those routes which already play a major part in carrying people into the congested urban centres, where other modes of transport are unlikely to be able to provide the additional capacity needed to underpin the growth.

3.2 Aspirations for the rail network

Transport for the North: A Northern Transport Strategy

Transport for the North is a partnership of the five city regions (plus Hull and the Humber) with the DfT, HS2 Limited, Network Rail and the Highways Agency. For some parts of the North capacity is as pressing an issue as in the South East, but the bigger problem is connectivity, with journeys between centres remaining very slow. The key to improving journey times (particularly east-west) is to fully integrate HS2 into the existing rail network.

The Northern Transport Strategy sets out the level of transformation in connectivity needed to deliver the Northern Powerhouse. It covers all travel modes and relates to the needs of freight as well as passengers. Recent work by, amongst others, the City Growth commission and Centre for Cities, has revealed that (on their own) Northern cities are too small to compete with London. If they were better connected they would generate strong agglomeration benefits; city centre growth has higher value and needs to be facilitated and these taken together will create an economic counterweight to London. Demand for travel (especially rail) is growing strongly across the region.

*The Northern Powerhouse
is an accepted part
of the vision for a
resurgent North.*

The Northern Transport Strategy has five key objectives:

- A dramatic speeding up of rail journey times between the six city centres based on what would be achievable with contemporary intercity standards
- Equivalent accessibility with direct rail access to the North's strategic international airport (Manchester)
- An increase in commuting capacity for each of the cities set at the Network Rail 'high' scenario level (120-150% and 100-130%)

- Reduction in the North's trading costs through investment in freight and logistics (including enhanced access to ports)
- Greater reliability and resilience of the Strategic Highway network in the longer term.

Rail North Long-Term Rail Strategy

Against this background the Long Term Rail Strategy adopted by Rail North establishes a vision for sustainable economic growth. Three over-arching objectives drive this Strategy for the North's rail services:



- Supporting sustainable economic growth by providing capacity and connectivity;
- Enhancing service quality, improving the appeal of rail and, by encouraging more rail use, reducing environmental impacts and carbon emissions through the provision of a coherent network; and
- Improving efficiency, reducing the cost per passenger and per tonne of freight carried – a cost effective railway.

A fundamental requirement that needs to be met is to ensure that there is adequate provision of capacity across the North. It is a core customer requirement to have a reliable service and not to be forced to use overcrowded services.

There will be a transformation of quality leading to a more coherent network achieved through a focus on an easy-to-use network, integrated across the modes, with a connecting timetable of local and express city to city services and a transformed fares system.

The planned electrification of key northern routes, alongside the specification of the replacement Northern and TransPennine Express franchises, will be used to trigger the achievement of a consistently good standard of train quality to ensure that ageing and unsuitable rolling stock does not damage the perception and appeal of the North's new network.

Together these measures will support a doubling of the forecast rail market share by the mid-2020s.

Cost-effectiveness will be improved and efficiencies will be delivered through:

- Network Rail's on-going investment programme, especially in signalling and electrification;
- Exploring alliancing and other means of better industry cooperation;
- The creation of cross-city services, with the goal of enhancing fleet utilisation;
- Fine-tuning services to match demand and facilitate better integration with bus and tram;
- Electronic ticketing with reduced retailing costs and simplified fares;
- Revised operating practices, more closely attuned to customer service and using new technologies; and
- Reducing costs per seat by, for example, deployment of longer trains and through revised approaches to train procurement.

The economy of the North will be stimulated through the improved connectivity that this revitalised rail network will provide:

- Better rail services between the North's major centres creating larger markets for growing business sectors as the economy recovers;

- Better services for commuters that help stimulate a return to the pre-recession expansion of the North's major city centres as hubs for economic activity and increased opportunities for accessing work, avoiding wasteful congestion and overcrowding and improving productivity;
- Better connections to international gateways that help support the accessibility of northern businesses to international markets;
- Better connections between areas of economic disadvantage and areas of economic opportunity;
- Better connections between the North's major towns and cities and more rural parts of the North including National Parks and Areas of Outstanding Natural Beauty;
- Better connections within and between the North's more rural areas that will help maintain communities through providing access not just to jobs, but also other important services (e.g. tertiary education, health), as well as supporting a visitor economy;
- Better connections with London and major centres across the rest of the Great Britain that help re-balance the economy away from the South East and further stimulate development and impact on key northern economic sectors, including tourism;
- Better access to ports and freight terminals with a network that has sufficient capacity for growth and is gauge-cleared for 9'6" container traffic; and
- Better connectivity and integration between rail and other modes of transport, including light rail and Metro networks, buses, walking and cycling supported by comprehensive park and ride provision in appropriate locations.

Better customer experience concerns easy to use and understand fares, the timings of services and connections, getting a seat in a comfortable carriage and a parking space at the station. It reflects changing travel demand. Better connectivity and improved customer experience will be achieved through the adoption of integrated network thinking. Stations can be integrated into wider economic planning, as part of wider regeneration plans.

Greater efficiencies will be derived by investing to replace old technology, re-assessing existing services and striking a balance of between what passengers pay and what comes from the public purse.

3.3 How does electrification contribute to this vision?

This vision could be achieved without any further electrification beyond that already committed, but that would not be the most effective way of doing so. Across the world a modern urban or indeed intercity railway is an electric railway because there are a number of significant benefits from electric traction. These each contribute to achieving the Rail North vision and should therefore be seen as an integral part of it.

A key attribute of an electrified railway is the lower operating cost compared to one where each train needs its own power source. These reduced costs flow from lower maintenance costs, reduced fuel costs and less wear on the track – together bringing about a significant reduction in operating costs for each train kilometre. Electric trains are also cheaper to purchase than the equivalently specified diesel units, and have a longer effective lifespan. These cost advantages – which contribute to the Rail North aspiration for a more efficient railway – need to be set against the capital cost of electrifying a route, which can be considerable. In general the balance favours more frequent services and those with longer trains, as these are the places where the reduction in operating costs are highest.



The second attribute and the one which flows into the conventional economic analysis of transport schemes is that, in general, electric trains offer better acceleration from stops than the equivalent diesel trains. This translates into shorter journey times which benefit existing passengers, attract users from other modes and contribute to wider economic benefits, such as those stemming from agglomeration. The better performance of electric trains may also create paths for additional trains on the multi user railway which characterises most of the rail network in the North of England, without the need for additional infrastructure work.

Sustainability is a key theme in the Rail North vision – economic growth without the consequential downsides of environmental and social degradation so evident in growing economies elsewhere. As the electricity supply industry moves rapidly to a much reduced reliance on fossil fuels for power generation, electric trains not only lead to zero emissions locally but also, through this decarbonisation of the grid, to a much lower overall carbon footprint for transport.

Electrification of the local rail network in the North of England gives the opportunity to bring in both new and also refurbished electric trains. These will contribute to providing additional capacity, leading to less crowding and so perceived shorter journeys for existing passengers and also the space for additional ones. These trains will be a core part of the programme to replace Pacer railbus units, for which there is strong political commitment. This will contribute to an overall perception of both attractiveness and also permanence for the local rail networks. It is this perception which is important if the rail network is to play its part in the revitalisation of the economy, making essential journeys pleasant.

3.4 How the economy gains

As indicated above, we would expect an electrified railway to deliver shorter journey times, a higher level of reliability and less crowding, all contributing to a better perception of the journey (crowded and unreliable journeys seem longer), which all translates into better accessibility (more jobs/people within a given catchment). The extra capacity which can be more easily provided also gives the space for more passengers, so city centres can grow.

The electric railway has lower operating costs for the same output and so less subsidy is needed to sustain a growing network. Resources can therefore be released for other purposes.

However significant investment is needed to achieve these benefits and this needs to be justified.

3.5 Framework for Investing in the Rail Network

Major investment in Britain's existing rail network is managed by Network Rail and funded through a complex regulatory process which covers work in a five year Control Period (CP). The work in the current Control Period for 2014 to 2019 has full government support and committed funding.

***Network Rail's Control
Period 5 started in 2014;
CP6 starts in 2019.***

Work currently identified in industry plans for future CPs, beyond 2019, is at an earlier stage of development and does not have committed funding, although it can be regarded as 'in the pipeline'.

Other projects, which arise from local initiatives, from immediate needs within the industry, or are of a smaller scale, can be slotted into this programme of major works if capacity is available, a business case can be made and funding is provided.

The current Control Period is CP5, which runs from 1st April 2014 to 31st March 2019. Some projects which will be considered as committed for CP5 will not be complete until 2020. A number of electrification projects which affect the North of England are included in CP5

and, together with the existing electric network, form the baseline position upon which a programme for further projects can be based.

Projects have a lifecycle which is outlined in terms of their status as defined in the rail industry's Governance of Railway Investment Projects (GRIP). The stages of interest are as follows:

- GRIP 2 (Pre-feasibility), where options that will deliver the required outputs have been identified;
- GRIP 3 (Option Selection – the expected output), where the scope has been determined and a single option to deliver the outputs has been identified;
- GRIP 4 & 5 project scope is further developed and a detailed design prepared;
- GRIP 6 Construction, Testing and Commissioning; and
- GRIP 7 The infrastructure is available for customer use.

Until a project has been scoped to GRIP3 it does not have confirmed funding or a place in the programme. For the purposes of this report, therefore, only electrification which has already been delivered and schemes which have been developed at least to GRIP3, with identified funding, are regarded as being “committed” and are within the baseline. This has consequences for a programme to electrify routes in the North of England, as to reach this stage a project needs significant development, requiring technical and commercial resources. A typical lead time would be two to three years.



Electrification projects now in progress in the North of England have been through this process and they add to an existing network of electrification which was started during the 1960s.

3.6 Key activities affecting the Baseline

The key activity for the North of England in CP5 is the Northern Hub project, with major investment in infrastructure in the network around Manchester City Centre, electrification of the core route across the Pennines from Liverpool to Leeds, York and Selby, with new or cascaded rolling stock to be sourced by the incoming franchisees.

Elsewhere, the electrification of the Midland Mainline, from Bedford to Sheffield provides an addition to the core network on which further electrification can be based. Separately there are proposals to create an ‘Electric Spine’ as the core freight link from the South Coast ports to the North. Currently the section in South Yorkshire does not have committed funding (Sheffield to Doncaster and to the Leeds – Doncaster route at Moorthorpe / South Kirkby Junction). Whilst shown on the baseline map on page 22, it is also included within our later prioritisation because of its location at the core of the South Yorkshire local rail network.

Concurrently with the work of the Task Force, Network Rail are updating their Electrification Route Utilisation Strategy (RUS). This work, which, after an initial filter, looks in detail at around a quarter of the non-electrified network in the North of England, has been an input to our more detailed analysis for the North of England.

Route Utilisation Strategies (RUSs) set out Network Rail’s longer-term vision for the network.

3.7 Current Industry Capacity

Very significant amounts of electrification are planned across Britain in the next five years – the Midland Main Line and Great Western Inter-City routes, North TransPennine, the Welsh Valleys and the Edinburgh – Glasgow corridor. This level of activity already appears to be

straining the current industry capacity. It is understood that no further projects of any scale can be accommodated during CP5.

Within this current programme approximately 100 to 120 single track kms of work each year (about 50 route kms) will be for the North of England network (and a similar output in Scotland, which matches a Scottish Government programme to electrify around 50 route kms per year). This level of output in the North of England may set the planning base level for future control periods, but the aspirations for the North of England should not be constrained by this current output. Indeed, as output at this level would give a programme lasting over forty years to complete electrification of all routes in the North, there is a strong case for a substantial increase in resources to allow an accelerated programme of electrification in the region, so bringing forward the direct benefits and harmonising with a rolling programme of rolling stock replacement.

Greater certainty on the long term electrification programme across Britain is required now to deliver the required increase in industry capacity in CP6 and beyond, which would then allow an accelerated programme of work in the North of England. It is clear from discussions with those involved in delivering current projects that much needs to be done to ensure that the necessary skills and resources are in place to sustain and then increase this level of output through the next decade.

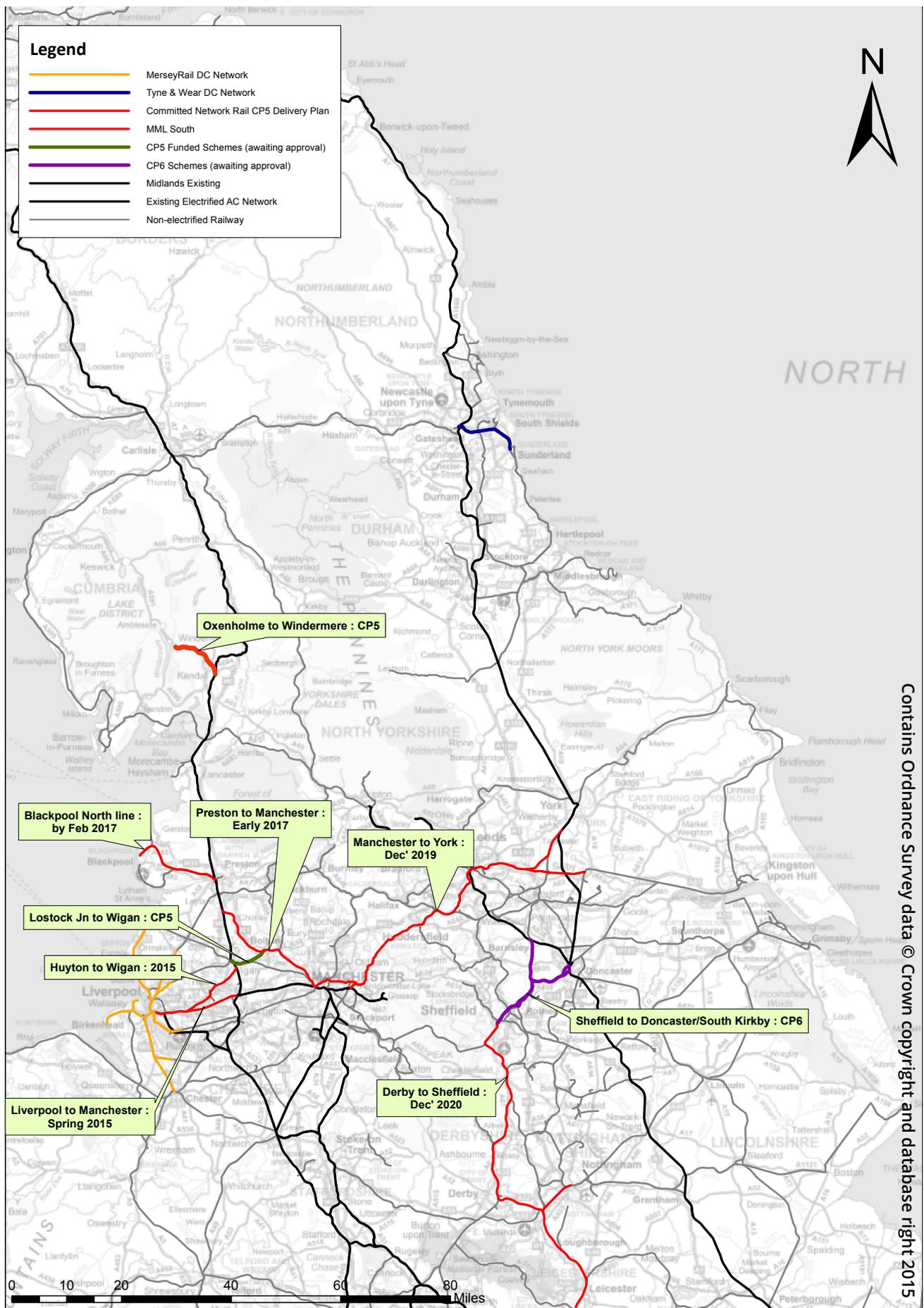
Resourcing needed for long term programme.

3.8 Existing and Committed electrification in Northern England by 2020

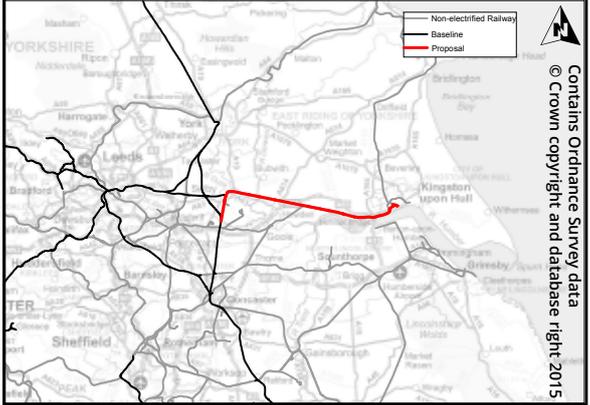
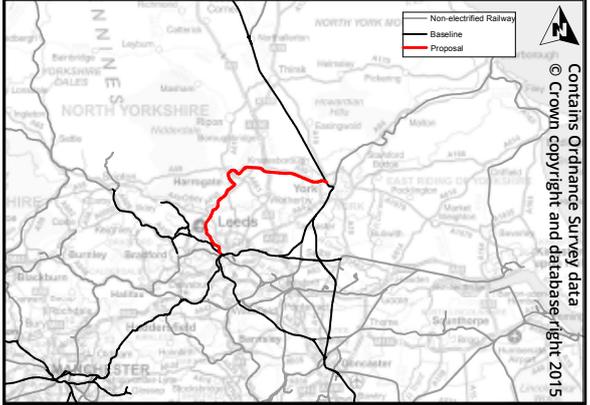
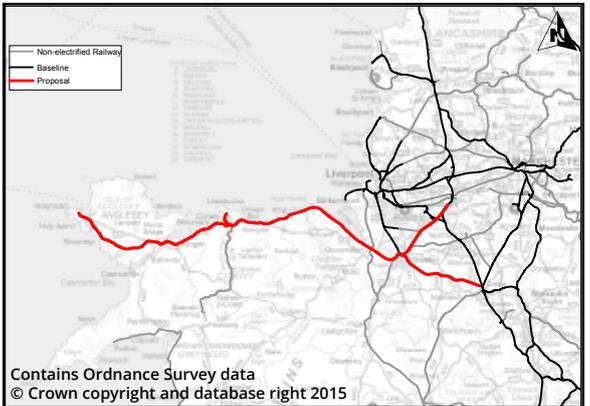
Section of route	Status
Doncaster – Berwick	In use
Doncaster – Leeds	In use
Stoke – Manchester	In use
Stoke – Crewe	In use
Crewe – Carlisle	In use
Crewe – Manchester, including via Styal	In use
Weaver Junction – Liverpool	In use
Stockport – Hazel Grove	In use
Manchester – Glossop/Hadfield	In use
Leeds / Bradford / Ilkley / Skipton	In use
MerseyRail Electrics	In use
Manchester – Liverpool via Chat Moss	In use in early 2015
Liverpool – Wigan	Under construction (Spring 2015)
Manchester – Bolton – Preston – Blackpool	Under construction (Early 2017)
Derby – Chesterfield – Sheffield	Midland (CP5 - 2020)
Manchester – Huddersfield – Leeds – York/Selby	TransPennine (CP5 - 2019)
Oxenholme – Windermere	North West (CP5 - 2017)
Lostock Junction – Wigan	North West – Funding available but Business Case to be finalised (Aspiration for CP5)
Sheffield – Doncaster / South Kirkby Junction	Electric Spine - completion indicated for CP6 but no funding yet allocated for construction

This baseline of committed schemes is shown on the map which follows. Note that this includes elements of the 'Electric Spine' (from Sheffield to Doncaster / South Kirkby) which are not yet programmed and do not yet have committed funding.

The electrified rail network in the North of England by 2020



3.9 Other proposals at an advanced stage of consideration

Section of route	Status	Geography
Temple Hirst Junction – Selby – Hull	Funding for Business Case. Political backing but no committed funding	
Leeds – Harrogate – York	Business Case prepared by local stakeholders for route modernisation and service enhancement. No programme date or committed funding	
Manchester – Bradford – Leeds & Hall Royd Junction – West Coast Mainline	Outline business case(s) prepared for wide scale enhancement, including potential electrification. Short term enhancements included in Leeds City Region SEP	
North Wales Coast	The North Wales Councils and the Welsh Government are currently appraising options for electrifying the complete route from Holyhead to Crewe / Warrington	

The specific proposals for the three North of England schemes and also that for the North Wales Coast are being developed independently from the Electrification RUS process.

The scheme to give electric services to Hull is being promoted by Hull Trains primarily on the basis of the long term cost savings for their London – Hull service. It would however also link with the core TransPennine scheme and with some minor additions, also allow an electric York – Hull local service. Work to bring the analysis and appraisal of this scheme up to GRIP3 level has been funded and is underway.

The Harrogate Line scheme is promoted by the West Yorkshire Combined Authority (WYCA) and North Yorkshire County Council, with the proposal (and the current published business case) being for a much larger scheme of service enhancement, of which electrification is an important part. It is a ‘stand-alone’ scheme and significant work will be needed to develop all the elements of this consistently to GRIP3.

The Calder Valley Line Enhancement Study, for WYCA, Transport for Greater Manchester (TfGM), Bradford City Council and Calderdale Council, considered wide-scale improvements to the lines between:

- Manchester and Leeds via Bradford;
- Hall Royd Junction, north of Todmorden, and the West Coast Mainline; and
- Milner Royd Junction and Heaton Lodge Junction via Brighouse, providing a connection to the Manchester to Leeds, via Huddersfield, TransPennine line, scheduled for electrification at the end of 2018.

Short term enhancements to frequency of service and rolling stock between Manchester and Leeds are included in the Leeds City Region Strategic Economic Plans (SEP). Network Rail are currently taking forward a core set of enhancements (not including electrification) for implementation in this control period (by 2019).

The North Wales route is the subject of a separate study by the Welsh Government and the six relevant local authorities. The preliminary work has already shown that the sections east and west of Chester cannot be considered in isolation and so any priority which the North of England assigns to the links from Crewe and Warrington to Chester must be seen as a preliminary view, to be reconsidered once the Welsh work is completed.



Each of the above has also been considered further by Network Rail as part of their Electrification RUS refresh, although the Calder Valley scheme therein differs in coverage from that within the Calder Valley Line Enhancement Study, with consideration of lines to Bolton, Clitheroe and Colne on the western portion.

3.10 Rolling stock

Much of the rolling stock currently used in the North of England was deployed during the 1980's and whilst this has been refreshed over its life, the quality / age and also the quantity of the available trains is a cause for concern:

- Some units (the Pacer railbuses) are difficult to adapt to the accessibility regulations which will apply from 2019
- Many units are restricted to 75 mph which makes it difficult to timetable services efficiently on main line stretches of the network and will be life expired within ten – fifteen years
- Services into the main cities of the region are overcrowded and therefore unattractive compared with alternatives, particularly private motor vehicles
- Other diesel units of the same vintage used elsewhere on the national network will also be life expired within the current timescales for electrification.

The national commitment to long term electrification of the rail network has led to some uncertainty in the rolling stock market for the longer term and also raises concerns over the short term availability of additional stock to provide much needed capacity in the North of England. In terms of the next ten – fifteen years this is currently resulting in:

- Expected lease costs for new diesel multiple units being considerably higher than the equivalent electric units (and also well above those for current stock)
- A shortage of suitable diesel units throughout the UK to cascade to the North of England to replace life expired units and provide additional capacity within the next five years.

Whilst there are possible solutions – and the incoming franchisees will be looking to address these – more electrification would increase the options available and help to speed the delivery of the enhancements which all parties want to see.

3.11 Baseline Conclusion

Most of the core rail network in the North will be electrified by the end of the decade. The priorities for adding to this, which we set out in the following chapters, are driven by the need to revitalise the economy of the North – providing capacity and connectivity for growth by investing in a rail network which is consistent in the level of provision and exudes quality throughout. These schemes need to be taken forward quickly through the rigorous stages of design and appraisal which are part of the industry process, but with an explicit inclusion of the wider potential gains to the economy as well as the standard transport benefits.



4.

Stakeholder engagement



4.1 The nature of the engagement

Local authorities across the North of England have a strong and united view on the need to invest in the rail network. Electrification is part of the infrastructure for creating a modern railway and so local involvement in the process we been through has been critical to ensuring local and regional initiatives to grow economies are recognised and to make sure that the methods adopted for prioritisation are widely understood and accepted by those with an interest in the outcome.

A separate report (See appendix 6 for links to this work) documents the aspirations of each authority and also the studies which have already examined the contribution an electrified railway could make to improved accessibility in the North. A substantial body of work is encapsulated in this document which will be of value as a reference for subsequent activity and also for the wider analysis of the links between an improved railway and a growing economy.

Alongside the wealth of factual data provided by this process there have been a series of meetings at which representatives from local authorities around the North have met together to discuss emerging findings and input their concerns. These meetings have also enabled colleagues from Network Rail to present the emerging findings from the national refresh of the Electrification Route Utilisation Study, which is taking place in parallel to our work.

4.2 Significant discussions

The Stakeholder meetings, seven in total through the course of the project, have been a key part of the process of collating the underlying economic information and emerging plans. The forum has enabled key issues to be identified and encouraged a consistency and level of information provision which might not otherwise have been possible.

Senior managers from the two franchise operators providing for regional travel the North of England (Northern and TransPennine Express) attended all the meetings and provided invaluable insight and a sense check on the emerging results.

The rail freight business has been represented and participants now have a greater understanding of the impact electrification might have on freight movement. In particular the need for a national plan for electrified freight as the context for any intervention is clear, as the limited impact of some locally promoted schemes in the absence of a wider plan became apparent through discussion and debate.

A particular interest are the links into North Wales through Chester. The Welsh Government and the North Wales authorities have been represented throughout the process and there is now a strong understanding of the interaction between the services east of Chester and those into Wales. From this it is clear that electrification south and east of Chester (to Crewe and Warrington) on its own would not give significant benefits and therefore these routes

must be considered in the wider context of the rail network along the North Wales coast. It is our view that a case for electrifying these routes will be heavily influenced by the strategic context, including the post HS2 pattern of services from London to North Wales and also the opportunities to link the North Wales coast with Manchester and destinations further east once routes over the Pennines are wired.

Representatives of areas with a preponderance of rural services or on the periphery of the region expressed some concern at the low priority given to services within these areas. A number of factors in the analysis have influenced this, including

- The need to electrify lines which form the core network before it is possible to run through electric services from these more peripheral areas to major destinations, preserving the current pattern of through services
- The impact that frequency of service and stopping patterns has on the economic benefits which arise from electrification on its own
- The almost imperceptible improvement in service (to the passenger) which would follow conversion of services currently operated by modern diesel units (eg Doncaster to Cleethorpes or York to Scarborough) and so the correspondingly modest economic benefit which could be counted in the analysis
- The lower populations in the areas which would benefit from any service improvements, which has a substantial impact on the economic benefit to the region as a whole which can be taken into account.

4.3 Interaction within the Task Force

A steering group of officials from Rail North, the DfT and Network Rail was formed to direct the technical work. Members of the Steering Group attended Task Force meetings to provide advice and to take forward decisions reached. These meetings also provided an opportunity for Task Force members to gain a broader understanding of the framework within which any project would be taken forward and also the nature of the constraints on rapid implementation.

4.4 Wider engagement

Two editions of an e-newsletter, 'Northern Sparks', were published to keep the full range of stakeholders up to date with the work of the Task Force and its supporting groups.



5.

The prioritisation process



5.1 Our Process

In establishing priorities for future electrification we have established the likely starting point – the baseline – which is the extent of committed electrification in the North of England, and we have then established three criteria which would be used to set the priorities for electrification. In examining the possible range of criteria it is clear that ‘contribution to the economy’ is key, given the Government’s emphasis on rebalancing the economic geography of the UK and the need to unlock the potential of the cities of the North.

Electrification of rail services is a means to an end – creating a more efficient railway – and has historically been driven by the:

- reduced capital and operating costs of electric trains for a given level of performance;
- better performance (acceleration and hill climbing) of electric trains, which can result in journey time savings for passengers and capacity improvements on constrained parts of the network – while certain current diesel units (Class 185/220/221 etc) can match electric performance, this is achieved at the cost of high fuel consumption and heavy weight;
- a better passenger experience and a significant benefit to the wider environment when coupled with a decarbonised electricity supply ; and
- better availability for service of electric units (they need less maintenance and are more reliable) so allowing smaller fleets, with consequential savings in depots and other facilities.

In establishing priorities for electrification we have been mindful that electrification in isolation is primarily an enabler for the enhancement of the rail service: it is the consequential changes and associated works which produce step changes in the service offered and therefore the large impacts on the economy, including the high benefit to cost ratios currently being quoted for major rail enhancement schemes in the North of England. These possible enhancements have not been considered in our quantification of economic impacts. This is acceptable for establishing relativities in relation to electrification, but in no way encapsulates the full value of an enhanced service to the economy. This would be a significant component in the preparation of the subsequent business case for each project.

A whole range of criteria were initially suggested for prioritising the conversion of lines from diesel to electric traction. However, in choosing a prioritisation framework the Task Force has been mindful of the need to concentrate on indicators which show a:

- relevance to the actual issue – electrification being the remit, not service enhancement or whole route modernisation;
- concentration on prioritisation not justification – this exercise is seeking to prioritise a rolling programme, not justify each scheme;

- use of simple criteria which are good proxies for a range of factors – and so can give a ‘quick’ overview (eg the use of diesel kms replaced per km of electrification in Network Rail’s initial ranking of schemes – which is a proxy for the cost savings, the direct passenger benefits from quicker journeys and newer rolling stock, and the indirect impacts on noise and emissions) which will indicate the relative value of electrifying a particular route to growing the economy sustainably.

Network Rail (NR) have used the diesel kms replaced per km of electrification as their initial indicator for sifting in work for the Electrification RUS refresh. In that work they have continuously recalculated this for each route, as they progress down a ranked list, on the basis that electrification of higher ranking routes has already been carried out. This tends to improve the priority for some lines from lower down the list, where services also operate on the higher ranked routes, as the diesel kms replaced for each km of electrification needed for the lower ranked line is greater.

Once this has been applied as an initial filter the RUS considers the top ranking schemes in considerable detail through a formal, industry standard Cost/Benefit appraisal.

This approach does not however completely address the local objectives for the rail network in the North of England (as set out in the LTRS), which are:

- Supporting sustainable economic growth;
- Enhancing service quality, improving the appeal of rail and, by encouraging more rail use, reducing environmental impacts and carbon emissions; and
- Improving efficiency, reducing the cost per passenger and per tonne of freight carried.

5.2 Our Objectives

We have agreed final objectives for a framework which allows priorities to be determined We have agreed final objectives for a framework which allows priorities to be determined against this background. We believe that the priorities for electrification should be set by reference to benefits alone – this is not an exercise in justification at this point and so the schemes which should be initially top of the list for further consideration should be those which give the highest benefits to the region. In doing this we have used three separate criteria:

- The economic benefits enjoyed by individuals and society as a whole through the changes in perceived journey times, from faster acceleration and through a reduction in crowding which gives a more pleasant journey, such benefits feeding through into changes in GVA resulting from better access between jobs and housing (Note: there is an assumption in our analysis that electrification will bring extra capacity to relieve crowding, even if there are no other changes to the service specification)
- The extent to which electric trains replace diesels which is a proxy for the impact on carbon emissions, the reduction in operating costs, and the ability to cascade newer rolling stock to the non-electrified services, should all be benefits to the region over the longer term
- The quality and quantity of the rolling stock currently used and the levels of crowding, which together indicate the broader impact that newer and higher capacity trains would have on the perception of the railway and its ability to facilitate growth in the economic centres.

5.3 Our Criteria

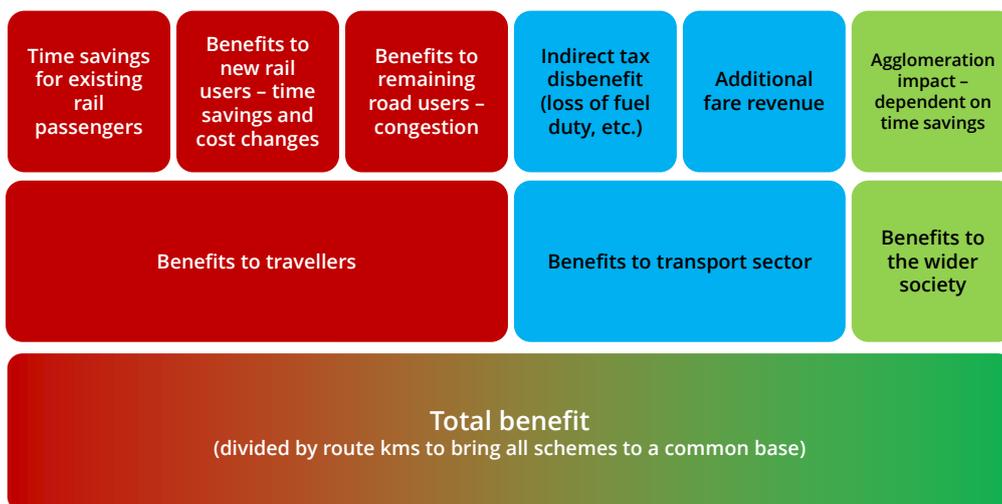
These objectives have been met by developing three criteria which can be derived directly from quantifiable inputs – journey times, distances, numbers and types of trains. In order to assist in deriving a single priority ranking the results for each segment of the analysis – the three criteria – need to be converted to a common base (or score) which can then be summed across all three components. This has been done by reference to the size of the package of lines being considered (route kms) where the basic values are clearly related to the size of the scheme (eg time savings leading to economic benefits) and then by scoring the resulting values on the appropriate scale.

Alongside the issue of standardising scores across criteria is the consideration of the relative importance of each criterion, or the ‘weight’ which should be attached to it. In line with the focus on promoting economic development our prioritisation process has put half the emphasis on this criterion, with the other half split between the second and third criteria. (see overleaf).

None of the potential schemes will exist in isolation and this gives some difficulties for prioritisation. All three criteria are to some extent dynamic – that is they may change as other schemes are implemented because there are synergies between lines and services. At this stage this impact is not assessed. However as business cases are developed to progress a programme, and the options for a more comprehensive set of enhancements are considered, the potential synergies can be considered in depth. This may lead to some re-assessment of priorities to make best use of resources and to maximise benefits, with a particular relevance to lines serving the eastern and western coasts, where electric services mirroring the current provision require lines in the centre of the region to be electrified as well before full benefit can be gained from the more local schemes.

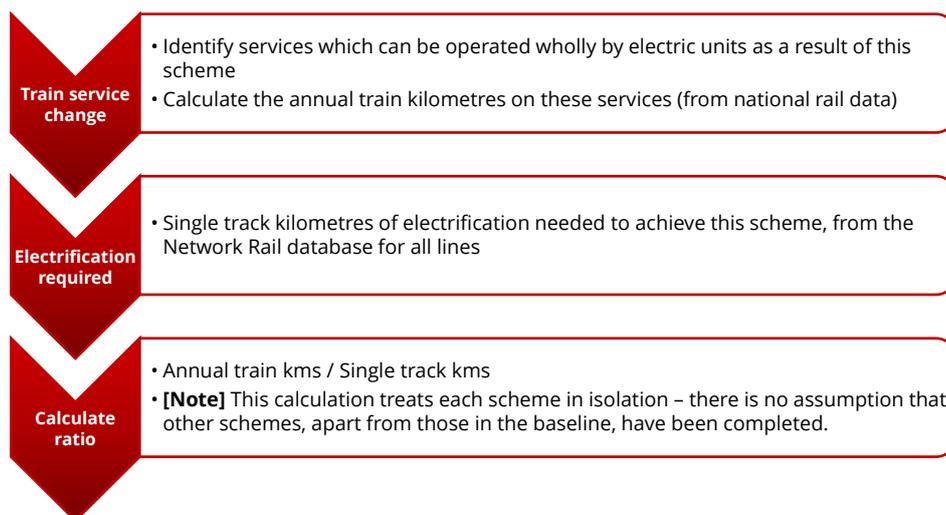
5.4 Calculating the scores

A variety of tools and data sources have been used to calculate the values which have fed into the various criteria, including the wealth of information on current train operating practices and the geography of the rail network, held by Network Rail, the economic forecasting model commissioned by Rail North and the rail industry timetabling assessment tool (MOIRA). Information on the plans for development and economic growth have been supplied for all the local enterprise partnerships in the region, using the Strategic Economic Plans as the base, with subsequent more detailed information being used where available and appropriate.



The ratio of diesel train kilometres saved to kilometres of electrification required was derived from information held by the rail industry. This includes the types of train used to operate each service and the track kilometres for each section of route.

Where appropriate results have been expressed in terms of 'benefit per kilometre of route' to allow direct comparison between large and small packages of electrification (otherwise large schemes would always out score smaller ones).



This information has been processed to give the scores explained in detail the summary table - for example a journey time reduction of between 15 and 30 seconds per stop has been incorporated into a new 'timetable' for a rail service. This timetable has then been processed through the rail industry's timetable assessment tool MOIRA to give changes in perceived journey times across the whole route, and for passengers who may use a service as part of a longer journey. Aggregate and average savings in time have then been used to calculate changes in patronage, reductions in car use and also the potential to increase economic output (the so called 'agglomeration' effect).

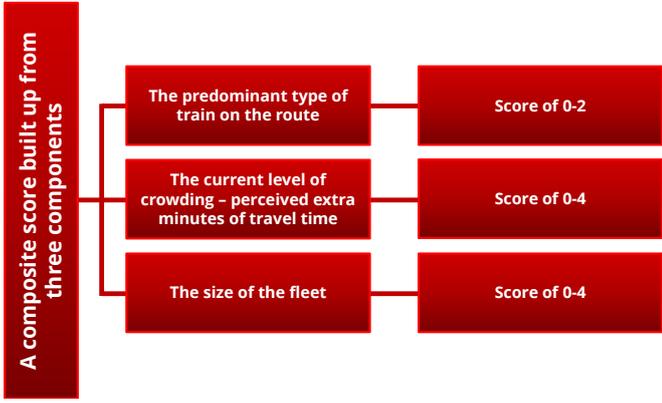
5.5 Overview of results

From the results obtained for each of the three criteria, scores on scale of 1 to 10 were calculated, then aggregated and weighted in accordance with the agreed process (Table above). Overall scores ranked from 84 down to 7. Although the scoring was targeted at issues which would directly impact on the ability of electrification to impact on the economy of the North of England there were many cases where the differences between discrete schemes were small and also the synergies between schemes would lead to changes in the ranking once a commitment to some higher ranking schemes was made.

A more detailed review of the list of schemes ranked in order of the scores showed two clear boundaries – at scores of 60 and 40. This gives three tiers of schemes, with the first tier being those to which immediate attention should be given if there is to be a rolling programme of electrification following on from the work which is already committed.

Single Track kilometres to be electrified in each Tier		
One	Schemes to be developed for funding in CP6 (2019 to 2024)	1450
Two	Schemes to be developed for funding post CP6 (2024) but also considered for alternative approaches	950
Three	Schemes to be considered for electrification in the longer term but considered for service enhancements using modern diesel trains in the intervening period	1600
Total single track kilometres of passenger routes across the North of England remaining to be electrified after 2019		4000

5.6 A summary of the methodology

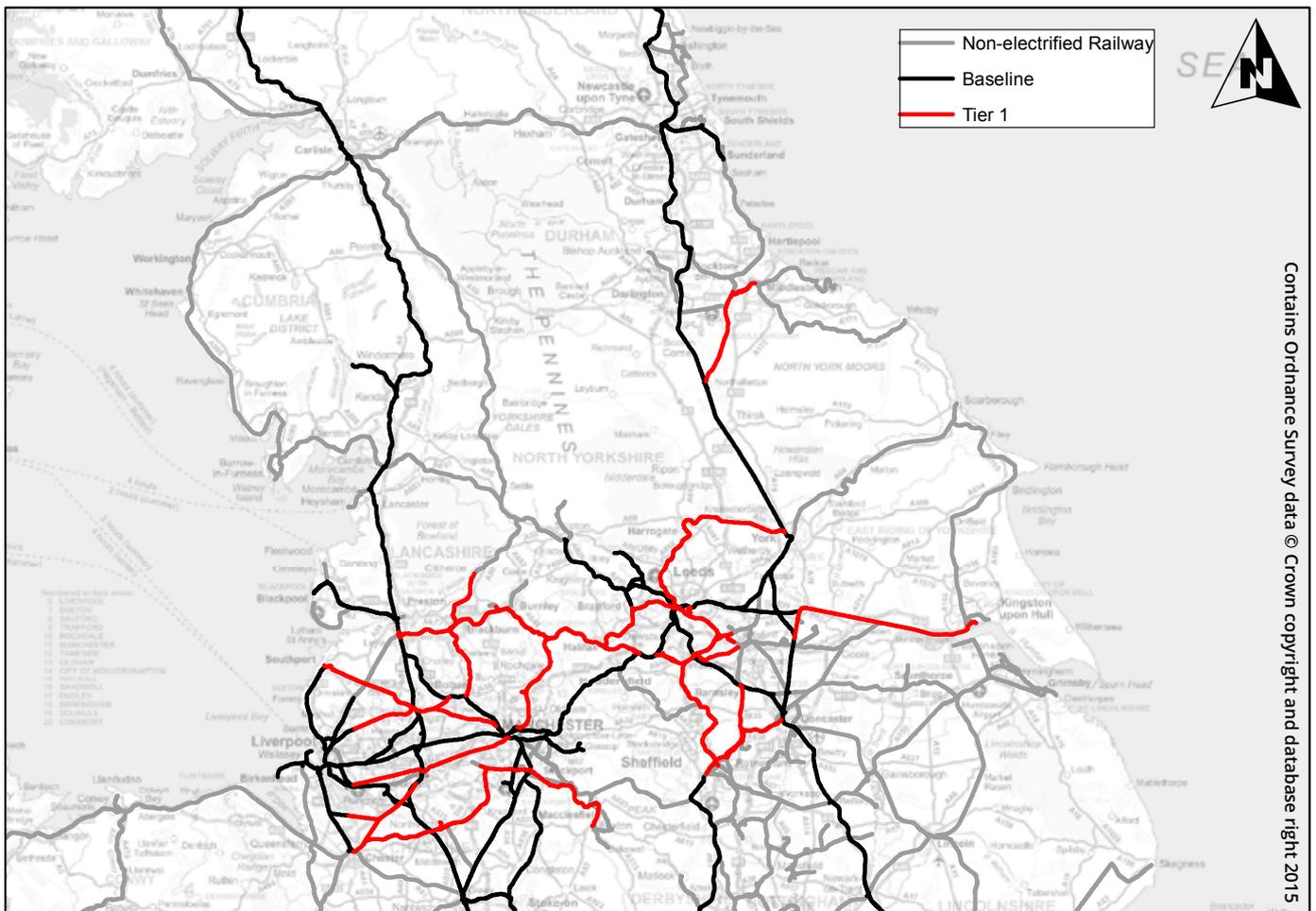
Criterion	Calculation of score	Contribution to the total score						
<p>Economic benefits</p> <p><i>All are based on the reduction in perceived journey time arising from an electric service of the same frequency and stopping pattern as the current service</i></p>	<p>Existing and new passengers save time because they have a faster service than they did previously</p> <p>Those in the wider community who continue to drive save time because there is less traffic on the roads because people use the train instead of their car.</p> <p>An increase in economic output resulting from the agglomeration effects (drawing communities together) created by the reduction in journey times</p> <table border="1" data-bbox="483 595 1222 976"> <tr> <td data-bbox="483 595 967 853">These three benefits are all expressed in monetary terms, over 60 years. They are added together and then divided by the length of route being electrified to bring all to a common base - £(benefit) per route km.</td> <td data-bbox="967 595 1222 853">Score of 0 - 8</td> </tr> <tr> <td data-bbox="483 853 967 976">Plus an assessment of the direct impact on economic development aspirations (qualitative)</td> <td data-bbox="967 853 1222 976">Score of 0 - 2</td> </tr> <tr> <td data-bbox="483 976 967 1066">Sum of economic scores</td> <td data-bbox="967 976 1222 1066">Total score (max 10)</td> </tr> </table>	These three benefits are all expressed in monetary terms, over 60 years. They are added together and then divided by the length of route being electrified to bring all to a common base - £(benefit) per route km.	Score of 0 - 8	Plus an assessment of the direct impact on economic development aspirations (qualitative)	Score of 0 - 2	Sum of economic scores	Total score (max 10)	<p>50%</p>
These three benefits are all expressed in monetary terms, over 60 years. They are added together and then divided by the length of route being electrified to bring all to a common base - £(benefit) per route km.	Score of 0 - 8							
Plus an assessment of the direct impact on economic development aspirations (qualitative)	Score of 0 - 2							
Sum of economic scores	Total score (max 10)							
<p>Impact on services, costs and environment</p>	<p>The ratio of [diesel vehicle kms replaced by electric] to the [Electrified Track kms required to achieve this], grouped by percentiles and scored from 1 to 10</p>	<p>20%</p>						
<p>Providing Capacity and Quality - Rolling stock enhancement and replacement</p>		<p>30%</p>						

6.

Priorities for electrification



6.1 The electrified rail network across the North of England with all Tier One schemes

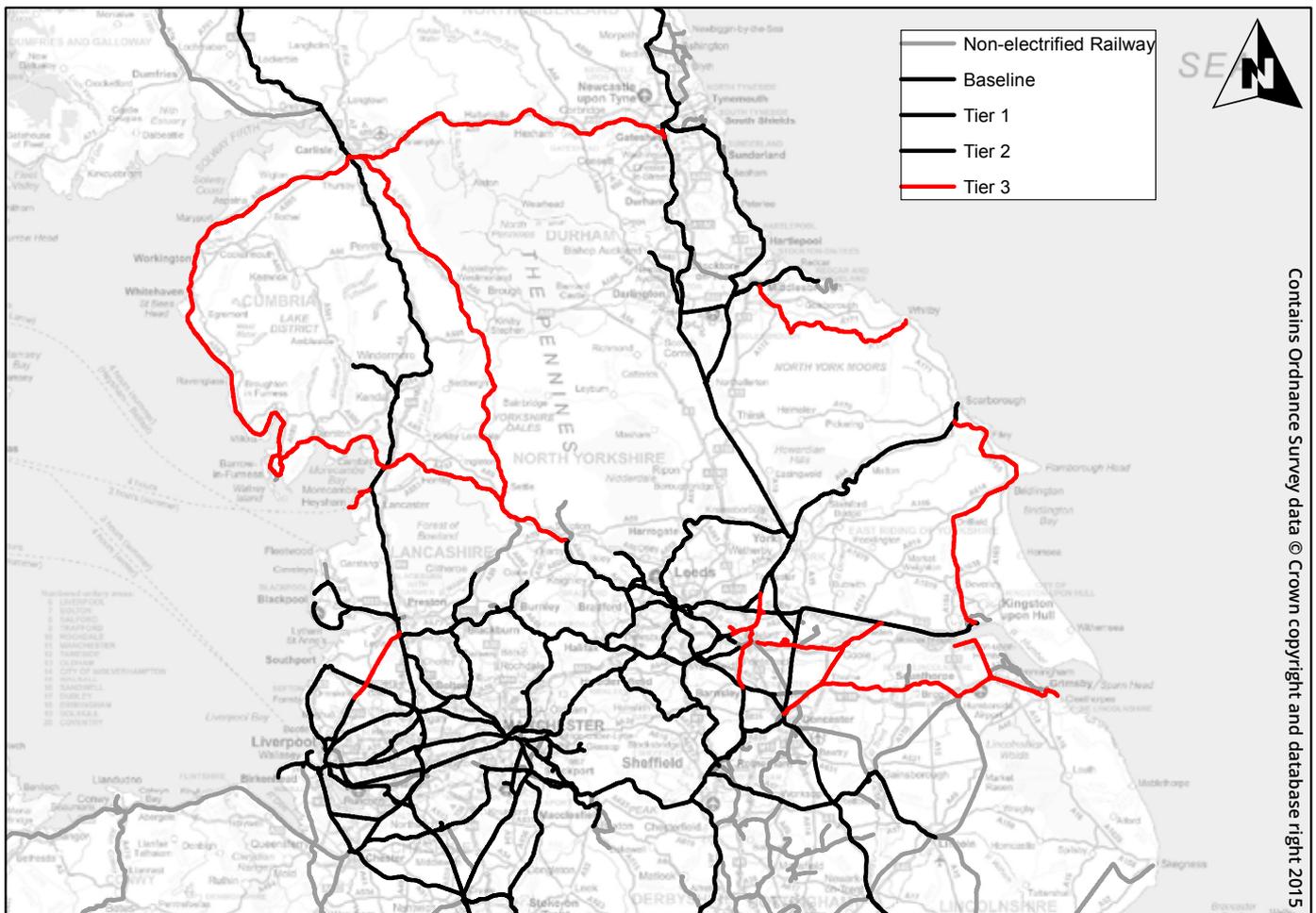


The criteria used to put all electrification schemes into priority order placed emphasis on the impact that electrification would have on the wider economy. The content of tier one reflects this. It should however be noted that together these schemes create a base on which subsequent electrification can be based, giving a significant boost to some of the more marginal routes.

We recommend that the schemes in this tier should be progressed through detailed design and business case development immediately, so that a properly costed and resourced programme can be presented for the next round of the rail industry planning cycle. This would allow schemes to start in 2019/2020 when the current committed programme comes to an end.

Within this tier the route from Warrington to Chester should be considered as part of the wider review of the electrification of links into North Wales. Although there are aspirations for additional services between Manchester and Chester over this line a full case for electrification would be difficult to make if the main services into North Wales had to remain diesel operated because there was no commitment to electrify west of Chester.

6.3 The electrified rail network across the North of England with all Tier Three schemes



Schemes in tier three include most of the long rural routes, some infill sections which currently have a limited service and the routes in and around the Humber, where some of the current through services could only be electrically operated once the South Transpennine route is electrified.

These routes will need to be reconsidered once the core of the network is programmed for completion.

The lines from Ormskirk to Preston and Moorthorpe/Castleford to York would not justify electrification on the basis of the current limited passenger service. However the economic analysis suggests that this limited service should be re-examined in the light of the wider economic plans for the region and particularly the growing importance of cities such as York and Preston. The links through the Pontefract area are also important both for freight and also as a diversionary route for longer distance passenger services. The benefit to the wider network should therefore be included in subsequent analysis of these routes.

7.

Freight and innovations in electric trains



7.1 Where does electrification of freight routes fit in?

Many of the economic plans for the North of England make passing mention of the need to encourage rail freight. This is not linked explicitly to electrification, indeed in most cases additional freight movements by rail would be diesel hauled for the foreseeable future because of the nature of rail freight, particularly the point in the cycle of investment in traction for these trains.

In some cases the potential to use electric traction for freight would strengthen the overall case for electrification (eg Northallerton – Middlesbrough), where there is already inter-modal traffic and the potential for a long haul along an already electrified route (East Coast Main Line) gives both cost and operational benefits.

In a number of cases there is merit in adding a few kilometres of electrification to what is basically a passenger scheme to give access to freight terminals (eg Stourton and Wakefield in Yorkshire). However there is a strong view emerging that these connections need to be considered by the operators of these terminals as part of their longer term business strategy.

Electrification into the new intermodal terminal at Liverpool 2 super port (to be considered by the terminal operators) and the early electrification of the Liverpool – Warrington – Manchester route would give significant opportunities for trans-Pennine electric freight, taking advantage of the North Transpennine and Calder Valley routes as these are added to the electric network.

As we have noted earlier the value of any particular piece of electrification to the freight operators is heavily dependent on:

- Electrification elsewhere – particularly links to the key inter-modal ports in southern and eastern England
- Types of flow – intermodal and high value are the key because they need speed and take capacity on key inter-urban routes.
- The length of haul, with electric traction being particularly attractive for long distances on the core intercity passenger routes
- a long term view – freight diesels are relatively modern and fuel efficient / they are only at mid-life now so replacement is not being considered until post CP6 (2025 onwards)

7.2 Alternatives to traditional electrification

Many of the lines noted in our Tiers 2 and 3 could be termed 'Branch lines', with characteristics such as:

- No freight at present or currently planned
- Low(er) maximum speeds
- Low frequency / short trains which in turn means low power needs

There are also sections of line where a power feed is already available from an existing sub-station, where the line can be completely closed for a short period for installation and where other cost reducing measures can be considered. This may mean that a business case based largely on operational economies can be developed for a cost effective electrification outside the criteria considered in this prioritisation exercise.

Another avenue which attracting increasing interest is the use of batteries. This was tried long ago in Aberdeenshire and more extensively in Germany, in both cases using the old lead acid batteries. With the rapid development of battery technology for use in road based transport there is renewed interest and a trial commenced in early 2015 of a converted Electrostar unit on the Harwich branch.

As currently configured the key characteristic of this train is that it will run for one hour on the battery for every two hours under the wires. Suitable services therefore:

- Branches with a junction to terminus time of 25 minutes or less each way
- Where the train also has a long journey on an electrified 'main line' of more than an hour each way, and a
- Significant proportion of 'through' passengers to make through running with more expensive train/greater weight worthwhile

An alternative to battery operation is the Hybrid / Bi-modal model being introduced with the IEP trainsets for Great Western and East Coast inter-city services. However this widely viewed as an unnecessarily complex and costly solution which may not be appropriate for many of the services we have been considering.

7.3 Modern diesel trains

Whilst our exercise in prioritising electrification has been conducted against a background assumption that ultimately all lines in the North of England will be electrified it must be acknowledged that it will be difficult to justify electrification of some routes for a long time, because they are characterised by:

- Low frequency service even with enhancements and patronage growth
- Low maximum speed
- Low demand through the day over the majority of the route, resulting from a low population in the catchment
- Minor interaction with electric network – effectively self-contained – or relatively short section of 'under the wires' operation by trains on the route

Some existing diesel units could be re-engineered to have a further twenty-year life and could provide a very acceptable travelling environment (air conditioning / 100mph / RVAR compliant / wide doorways) for these services.

It is also highly likely, given the time constraints that new diesel trains will be needed to fill gaps left with the retirement of Pacer railbuses and provide both the quality and capacity boost promised with new franchises for the North of England. These trains will match modern electric units in ambience and will have a thirty to forty year life. They would then be transferred to the remaining non-electrified routes as other lines are wired and services converted.



8.

Conclusions and Recommendations



8.1 The Task Force approach

Our approach has been based on two key principles – widespread consultation with key stakeholders, and robust application of an objective process.

We believe this approach has been successful in developing a consensus around both the objectives and the resulting recommendations. Nevertheless, this report and its recommendations are those of the Task Force alone.

8.2 The prioritisation process

The process we adopted concentrated on the economic growth benefits achieved by electrifying rail routes in the North of England. Our approach was very much aligned to the goal that ALL of the North's rail network will be electrified in due course, and as such our task was to advise Government on the order in which this should be done.

It is the view of the Task Force that the capacity of the industry needs to increase in order to deliver the programme set out in this report. We are also firmly of the view that a long term, stable programme of electrification is the only way to achieve this, while driving down the costs of electrification and increasing the speed of its implementation.

We have provided a clear view on what pattern and order of work would generate the greatest benefit. We set alongside this other factors such as the best use of electric rolling stock. The method we adopted is based on a clear analytical foundation, using consistent information to evaluate each section of railway line. This was extensively discussed by a technical group of rail operators, Network Rail, Department for Transport and local authority officers. The method and appraisal criteria were agreed before the detailed analysis was undertaken, and resulting outcomes presented. Therefore the results have not been influenced by preconceptions or any considerations of 'special cases'.

8.3 Emerging priorities

The priorities which have emerged fall into three distinct tiers, as set out in this report.

Tier One	Tier Two	Tier Three
Calder Valley – Leeds to Manchester and Preston via Bradford and Brighouse	Manchester to Sheffield and south east Manchester local services	Barrow to Carnforth
Liverpool to Manchester via Warrington Central	York to Scarborough	Pontefract to Church Fenton
Southport/Kirkby to Salford Crescent	Bishop Auckland/Darlington to Saltburn and Sunderland	Hull to Scarborough
Chester to Stockport	Barnsley to Huddersfield	Ormskirk to Preston
Northallerton to Middlesbrough	Sheffield to Lincoln via Retford	Carlisle to Newcastle
Leeds to York via Harrogate	Chester to Crewe	Skipton to Carlisle
Selby to Hull	Burnley to Colne & Kirkham to Blackpool South	Barton on Humber
Sheffield (Meadowhall) to Leeds via Barnsley / Castleford & connections	Knottingley to Goole	Cumbrian Coast
Bolton to Clitheroe		Doncaster to Gilberdyke
Sheffield to Doncaster/Wakefield Westgate (Dearne Valley)		Cleethorpes to Thorne (Doncaster)
Hazel Grove to Buxton		Middlesbrough to Whitby
Warrington to Chester		Skipton to Heysham

We believe that ALL these routes need electrifying, starting with those in the first tier, based primarily on the scale of economic impact they will bring. This provides the core foundation for the remaining tiers.

8.4 Next steps

This report delivers on the task Government set us on 13th December 2013. It is necessarily high level but we believe provides a sound starting point for a stable electrification programme for railways in the North of England.

We recommend that:

- government commits to the goal of full electrification of routes across the North of England, and to a rolling long term programme to deliver this;
- the rail industry (and associated utilities in particular the energy sector) rise to this challenge to increase the amount of electrification it can deliver year on year in the north;
- the routes detailed in Tier One should now be taken forward through the production of more detailed business cases with a view to including them in the work programme for the next rail industry 'Control Period' (2019 to 2024). Rail North and Network Rail should jointly progress this work and we therefore ask Government to prioritise resources, identified specifically for this purpose, so that work can progress with the required degree of urgency.
- Network Rail, in developing which pieces of route are taken forward into the rail industry's National Long Term Planning Process, take full account of the work undertaken by this Task Force, and ensure that investment in the North of England's rail infrastructure is given a clear priority. This is a key building block to the wider aspirations of Northern city regions as part of the 'Northern Powerhouse' and 'Transport for the North' initiatives.

We also acknowledge that, while not in our remit, routes from the North of England into North Wales must be considered as a whole, recognising that progress in electrification in the North of England opens opportunities for North Wales, and so priority for electrification of these lines should be considered by Government.

We commend this report to Government.

Appendices



Appendix 1 – Task Force members and the Terms of Reference

Andrew Jones MP	Member for Harrogate and Knaresborough Chair of the Task Force
Julie Hilling MP	Bolton West
Ian Swales MP	Redcar
Terry O'Neill	Leader – Warrington Borough Council
Dave Green	Leader – Bradford City Council
Bill Dixon	Leader – Darlington Borough Council (Reserve)
Roger Jones	Department for Transport (Advisory role)
Jo Kaye	Network Rail (Advisory role)

The Task Force met in London on four occasions.

Terms of Reference for the Task Force

Objective and scope

The North of England Rail Electrification Task Force is remitted to identify and recommend to Government a programme for the development and implementation of rail electrification schemes in the North of England (the area covered by the Rail North consortium of Local Authorities) taking account of all relevant factors including:

- local and regional strategic economic development plans
- local and regional transport and rail development plans – including Rail North's Long Term Rail Strategy and relevant plans of the Welsh Government
- ongoing development of the rail industry national Electrification Strategy (Electrification RUS), led by Network Rail, and other rail industry plans and strategies
- the development and delivery of the committed rail electrification programme within Network Rail's national Delivery Plan for the period to 2019
- the development and delivery of the Northern Hub and other committed rail investments in the North of England in the 2014 – 2019 period
- the DfT passenger franchising programme and plans for decentralisation of decision-making on rail service provision to local and regional bodies
- the business case for and level of development of individual electrification proposals
- the availability of funding for both capital works and operational subsidies – including local authority / LEP, European and private sector funding
- efficient electrification delivery, supply chain resource availability and synergies with other rail and transport projects
- availability of electric rolling stock and the redeployment / disposal of diesel rolling stock
- rail industry technical developments, for example discrete / discontinuous electrification and battery-powered rolling stock

- considering the interdependence of service planning and the impact of making changes
- Defining an overarching objective for choosing or prioritising electrification projects – e.g. is it cost/environmental issues/supporting or stimulating economic growth/reducing journey speeds?

Approach

The Task Force will be supported by a Steering Group, a Stakeholder Working Group led by Rail North and by the existing rail industry national Electrification Strategy (RUS) Working Group led by Network Rail. The Task Force will consider papers presented by the Groups for endorsement including the report to Government recommending a programme for electrification scheme development and implementation.

Timescales

The Task Force is to produce a report to the Secretary of State for Transport by February 2015. It is anticipated that the Task Force will meet approximately every 2-3 months. DfT will provide the secretariat.

Membership

The Task Force will consist of three MPs from the North of England (nominated through the existing All-Party Parliamentary Rail in the North Group), two local authority Leaders nominated by the Rail North consortium, and senior officials from Network Rail and DfT. The Task Force will elect its own chair/co-chair, or may choose an independent person to chair.

Appendix 2 – Membership of the Steering Group

Rail North
Network Rail
Department for Transport
Welsh Government
Welsh Office

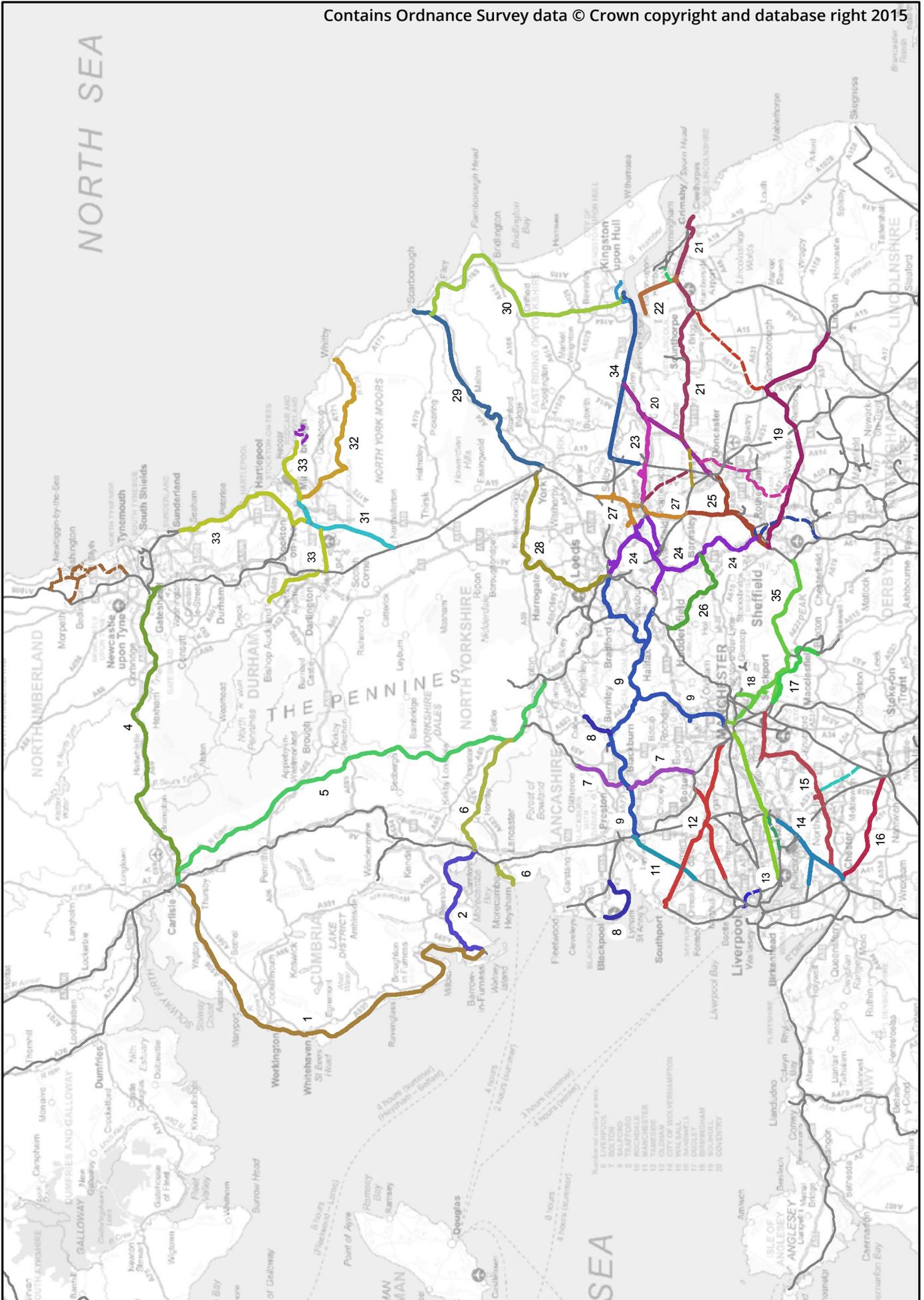
Appendix 3 – The Stakeholder Working Group

City of York Council/North Yorkshire County Council
Denbighshire Council (representing the six North Wales Councils)
Department for Transport
First TransPennine Express Ltd
Freightliner Ltd
Hull City Council
Lancashire County Council
Merseytravel
Middlesbrough Council
Network Rail
Nexus
North East Lincolnshire Council
North Lincolnshire Council
Northern Rail Ltd
South Yorkshire PTE
Systra
Tees Valley Unlimited
Transport for Greater Manchester
Transport for Warrington
West Yorkshire Combined Authority

The Stakeholder Working Group met on seven occasions, at a range of locations across the North of England.

Appendix 4 - The detailed results

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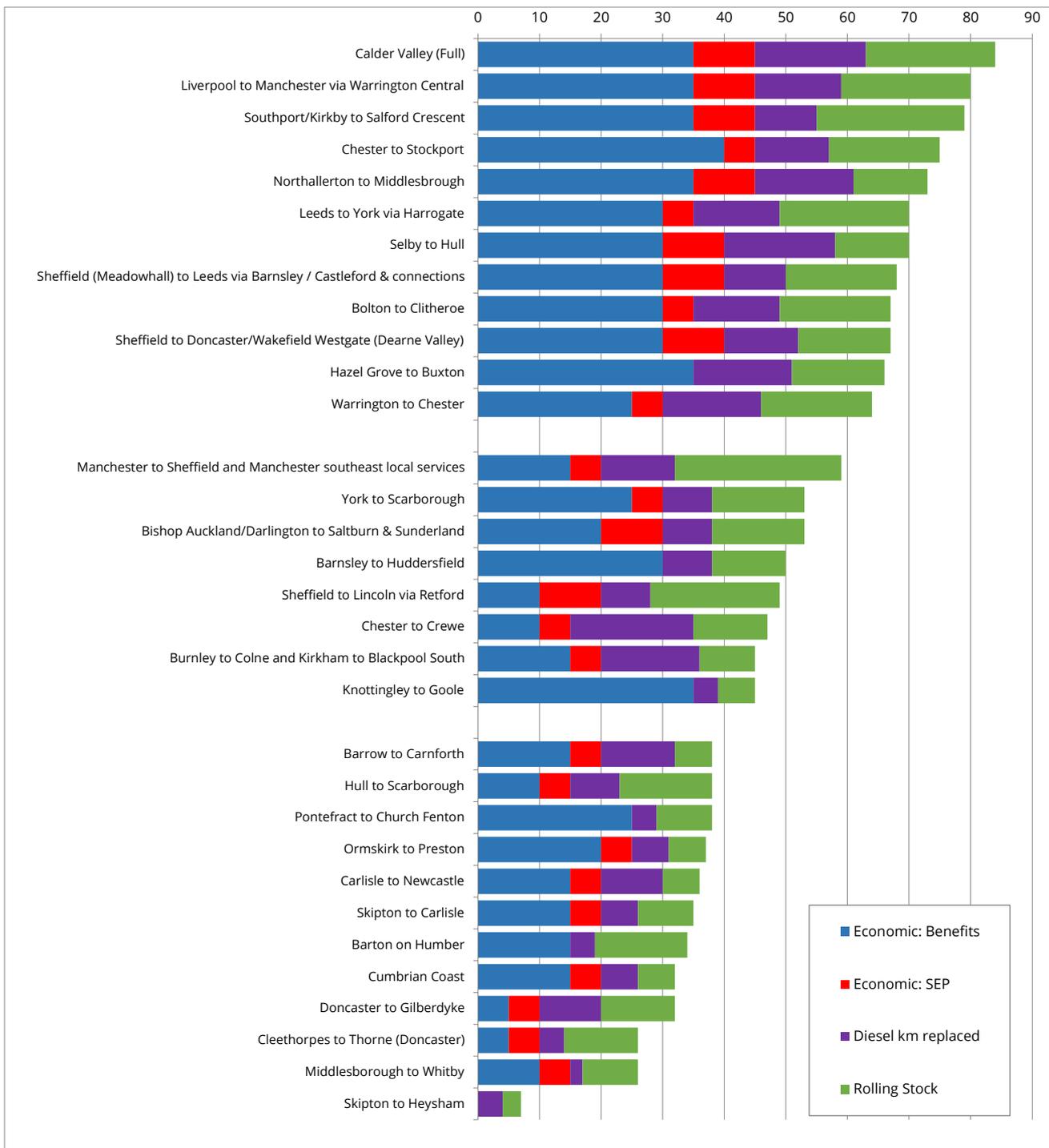
The non-electrified rail network in the North of England was divided into 34 sections for prioritisation, based on current service patterns. In the final analysis we used 32 – the Windermere branch subsequently received committed funding for electrification and we combined the lines serving Colne and Blackpool South, on the basis of current services. The map shows the sections and is the key to the following table.

Map reference	The schemes	Weighted score
9	Calder Valley (Full)	84
13	Liverpool to Manchester via Warrington Central	80
12	Southport/Kirkby to Salford Crescent	79
15	Chester to Stockport	75
31	Northallerton to Middlesbrough	73
28	Leeds to York via Harrogate	70
34	Selby to Hull	70
24	Sheffield (Meadowhall) to Leeds via Barnsley / Castleford & connections	68
7	Bolton to Clitheroe	67
25	Sheffield to Doncaster/Wakefield Westgate (Dearne Valley)	67
17	Hazel Grove to Buxton	66
14	Warrington to Chester	64

18	Manchester to Sheffield and Manchester southeast local services	59
29	York to Scarborough	53
33	Bishop Auckland/Darlington to Saltburn and Sunderland	53
26	Barnsley to Huddersfield	50
19	Sheffield to Lincoln via Retford	49
16	Chester to Crewe	47
8	Burnley to Colne & Kirkham to Blackpool South	45
23	Knottingley to Goole	45

2	Barrow to Carnforth	38
27	Pontefract to Church Fenton	38
30	Hull to Scarborough	38
11	Ormskirk to Preston	37
4	Carlisle to Newcastle	36
5	Skipton to Carlisle	35
22	Barton on Humber	34
1	Cumbrian Coast	32
20	Doncaster to Gilberdyke	32
21	Cleethorpes to Thorne (Doncaster)	26
32	Middlesbrough to Whitby	26
6	Skipton to Heysham	7

The prioritisation scores by route, showing the components of the score



Appendix 5 – Abbreviations and Glossary

DfT	Department for Transport
DMU	Diesel Multiple Unit – standard regional passenger diesel train
ECML	East Coast Main Line – from London Kings Cross to Yorkshire, North East England and Edinburgh
EMU	Electric Multiple Unit – standard regional passenger electric train
GjT	Generalised Journey Time – the cost (in minutes) that a passenger perceives the journey to be, including fare as a function of value of time
LEP	Local Enterprise Partnership
MML	Midland Main Line – from London St Pancras to Sheffield via cities in the Midlands
MOIRA	The standard rail industry analysis tool for estimating the impact of a timetable change on the use of services and also for calculating the benefits perceived by passengers from enhanced services.
SEP	Strategic Economic Plan – developed by a LEP
tph	Trains per hour
WCML	West Coast Main Line – from London Euston to the Birmingham, North West England and Glasgow

Appendix 6 – Links to other relevant reports

Network Rail: Electrification Route Utilisation Study (2015)
www.networkrail.co.uk

Rail North: Long Term Rail Strategy (2014)
www.railnorth.org

Transport for The North: The Northern Transport Strategy
www.transportforthenorth.com

Department for Transport: Northern and TransPennine Express Franchises – Invitations to Tender
www.gov.uk

Greengauge21: North Wales Coast electrification
www.greengauge21.net/publications/economic-and-social-benefits-of-rail-investment-for-north-wales/

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